Further Contributions to a knowledge of the Influence of Employments upon Health. By WILLIAM AUGUSTUS GUY, M. B., Cantab. Professor of Forensic Medicine, King's College, and Physician to King's College Hospital. Hon. Sec., &c.

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IN the last number of the Journal of the Statistical Society I examined the influence of employments upon health by means of two concurrent probabilities; the ratio of cases of pulmonary consumption to those of all other diseases, and the observed age at which pulmonary consumption occurs. The results of the two inquiries were found to confirm each other. Another probability remains to be added, viz., that derived from the registered ages of persons following the several kinds of employment. In the books of the King's College Hospital, from which the materials for the former paper were taken, the ages of the applicants for relief are carefully noted down, as well as their employments; and as the persons so registered amount to several thousands, abundant materials are furnished for the present inquiry, considered merely in the light of an attempt to confirm two probabilities already established by a third.

Before entering upon this inquiry, it is necessary to premise, that, in common with the data made use of in the former essay, this test of the observed ages of persons following the several employments is by no means free from objection. For if we assert that a large excess of young persons in any employment is a proof of the unhealthiness of that employment, we encounter the objection that the occupation may be such as to require an excess of young persons; and this is true, especially where machinery is extensively employed. The same excess of young persons would show itself in employments requiring either a degree of perfection of the senses or an amount of strength which is not possessed by the aged.

It is difficult to estimate the force of either of these objections, but especially the last; for no data are in existence by which to determine the period of superannuation in the several employments. There is reason, however, to believe that it is earlier in men who are engaged in occupations requiring great exertion, than in those whose employments are of a sedentary nature, and require merely an ordinary steadiness of hand, and an average perfection of the senses. Thus in the case of the letter-press printers, the pressmen use strong exertion, while the compositors stand in the same posture, making small, but rapid, movements of the hands; and the oldest pressman entered on the hospital books was 59, whilst the oldest compositor was 70; and no less than 7 compositors exceeded 60 years of age. This disproportion corresponds very nearly with the results of some careful inquiries which I am now engaged in making among the letter-press printers. It is probable, then, that the period of superannuation is earlier in employments requiring great exertion; and this probability requires to be borne in mind.

The first objection already stated to the assertion, that an excess of young persons in any occupation is a proof of its unwholesomeness, viz., that the occupation may be such as to require a disproportion of young

persons, does not carry much weight with it, except in the case of employments requiring the extensive use of machinery; for in other cases there is not much difference in the ages at which men begin their employments. Thus, to use the illustration already employed, the pressman begins his occupation nearly at the same time with the compositor, or at any rate, not more than one or two years later.

The objections now stated apply to a comparison of the observed ages of men following different employments, whatever may be the registers from which those ages are taken; but it must not be forgotten that, in the present instance, the ages are those of men applying for relief among the out-patients of an hospital, and that the attacks of sickness in the several employments may not bear the same relation to the ages of the workmen. As, however, by far the majority of the diseases occurring among out-patients, with the exception of consumption, are of that unimportant class which is likely to be but little dependent upon the nature of the employment, it is highly probable that the registered ages will nearly represent the average ages. I shall return to this question presently.

The objections which have been mentioned, though they would be fatal to results standing alone, and without support from analogous observations or reasonings, are not such as to prevent the employment of the proposed data, provided they are used merely as probabilities in support of others derived from analogous sources. It is for this limited purpose that they are now employed.

It is proposed to examine the subject of the present paper in the order observed in the former essay, beginning with the division into in-door and out-door occupations, and then subdividing these according to the nature of the influences to which they expose the body. The following table corresponds with Table IV. of the former essay, and exhibits the registered ages of 4.869 males engaged in in-door and out-door occupations, each division comprising precisely the same employments as in the essay referred to. The total number, and the per centage proportion for each period of five years, is stated.

TABLE I.—*Showing for each quinquennial period the Number and per centage Proportion, of Males following in-door and out-door occupations.*

Nature of Occupation.	Under 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 65	65 to 70	70 to 80	80 & upwards	Total.
In-door.	83	435	620	509	360	321	227	202	173	141	74	56	49	4	3,254
Out-door	48	144	277	210	161	198	150	144	93	84	50	39	14	3	1,615
In-door.	2·55	13·36	19·05	15·64	11·06	9·86	6·99	6·21	5·32	4·33	2·28	1·72	1·51	0·12	
Out-door	2·97	8·92	17·15	13·01	9·98	12·26	9·29	8·92	5·76	5·20	3·09	2·41	0·86	0·18	

The real value of the results exhibited in this table will best appear on comparing the per centage proportions under and above 40 years of age, and above the ages of 50, 60, and 70 respectively in the two classes of occupation. This comparison is made in the following table.

TABLE II.—*Showing, for the two Classes of Employment, the per centage Proportion under and above* 40 *Years of Age, and above* 50, 60, *and* 70 *respectively.*

Nature of Occupation.	Under 40	Above 40	Above 50	Above 60	Above 70
In-door . .	71·52	28·48	15·28	5·63	1·63
Out-door . .	64·29	35·71	17·50	6·54	1·04

The last column of this table tends to confirm the statement that the period of superannuation occurs earlier among men following the more laborious employments, for these employments are greatly in excess in the class of out-door occupations. The greatest age recorded among men following in-door employments is 91,* the oldest man among those working in the open air is 82. The other columns of the table show an excess of middle aged and old men among those following out-door occupations as compared with those working within doors. This is a strong argument in favour of the greater healthiness of the former class of employments.

These two classes, as was stated in the former essay, contain some occupations of a mixed kind, and others which may be presumed to exercise an injurious influence upon health. These occupations were accordingly excluded, and the remainder thrown into a table by themselves. (Table V. of the former essay.) The following table shows the result of the exclusion of all such employments.

TABLE III.—*Showing, for the two Classes of Employment, all exceptional Occupations being excluded, the per centage Proportion under and above* 40, *and above* 50, 60, *and* 70 *respectively.*

Nature of Occupation.	Under 40	Above 40	Above 50	Above 60	Above 70
In-door . .	73·98	26·02	13·60	5·62	1·67
Out-door . .	63·83	36·17	17·95	7·04	1·15

The results of this table correspond with those of the foregoing, the last column, as before, presenting an excess of aged persons among those following in-door employments, but all the other columns showing a greater proportion of middle aged and old men in the class of out-door employments.

The next inquiry instituted in the former essay was into the comparative healthiness of occupations carried on in-doors and out-of-doors respectively, but requiring different degrees of exertion, with a view to ascertain the influence of exercise in preserving or impairing health. This comparison was made in Table VI. of the former essay; the ages of men following the same employments are exhibited in the following table.

* This man's employment was that of a herald-painter.

TABLE IV.—*Showing for each quinquennial period the Number and per centage Proportion of Males following the several undermentioned Classes of Employment.**

Nature of Occupation.	Under 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 65	65 to 70	70 to 80	80 & upwards.	Total.
In-door :—															
Requiring little exertion .	21	108	147	132	97	76	56	33	33	24	23	10	15	1	776
Requiring more exertion .	22	169	251	199	123	99	80	78	54	52	21	27	20	1	1196
Requiring great exertion .	6	59	41	37	34	43	25	26	17	21	2	5	1	2	319
With varied exercise . .	7	52	58	53	39	36	19	18	16	12	7	5	2	..	324
Out-door :—															
Requiring moderate exertion	29	60	82	64	40	52	42	39	24	19	13	11	2	2	479
Requiring greater exertion.	17	71	169	123	100	132	95	90	62	55	36	28	11	1	990
In-door :—															
Requiring little exertion .	2·71	13·92	18·95	17·01	12·50	9·79	7·22	4·25	4·25	3·09	2·96	1·29	1·93	0·13	..
Requiring more exertion .	1·84	14·13	20·98	16·64	10·28	8·28	6·69	6·52	4·52	4·35	1·76	2·26	1·67	·08	..
Requiring great exertion .	1·88	18·50	12·84	11·60	10·66	13·48	7·84	8·15	5·33	6·58	0·63	1·57	0·31	0·63	..
With varied exercise . .	2·16	16·05	17·91	16·37	12·04	11·11	5·86	5·55	4·94	3·70	2·16	1·54	0·61	..	..
Out-door :—															
Requiring moderate exertion	6·04	12·53	17·12	13 36	8·35	10·86	8·77	8·14	5·01	3·96	2·72	2·30	0·42	0·42	..
Requiring greater exertion .	1·72	7·17	17 08	12·42	10.10	13·34	9·59	9·09	6·26	5·55	3·64	2·83	1·11	0·10	..

The following table exhibits the per centage proportion below and above 40 years of age; and above 50, 60, and 70 respectively.

TABLE V.—*Showing the per centage Proportion, for each quinquennial period, below and above* 40 *Years of Age, and above* 50, 60, *and* 70 *respectively.*

Nature of Occupation.	Under 40	Above 40	Above 50	Above 60	Above 70
In-door :—					
Requiring little exertion . .	74·88	25·12	13·65	6·31	2·06
Requiring more exertion . .	72·15	27·85	14·64	5·77	1·75
Requiring great exertion. .	68·96	31·04	15·05	3·14	0·94
With varied exercise . . .	75·64	24·36	12·95	4·31	1·61
Out-door :—					
Requiring moderate exertion.	68·26	31·74	14·83	5·86	0·84
Requiring greater exertion .	61·83	38·17	19·49	7·68	1·21

This table, which corresponds to Tables VI. and XVII. of the former essay, strengthens the probabilities established by those tables. Table VI. showed that in in-door employments the ratio of cases of pulmonary consumption to those of other diseases varies inversely as the amount of exercise, and Table XVII. that in the same class of employments pulmonary consumption occurs at an earlier age where the amount of

* In this and the succeeding table the class of in-door employments, with varied exercise, has been placed by itself, instead of coming second in order, as in the former essay. This class, including the waiter, footman, &c., does not admit of exact comparison with other in-door occupations; and there are obvious reasons, independent of the influence of the employments themselves upon health, why there should be an excess of young persons in this class.

exertion required is least. The foregoing table confirms both these results by showing that the number of men under 40 years of age is greatest where there is least, and least where there is most exertion. There is also the same close agreement between the results of the foregoing table and Table XVII. of the former essay, in respect of the class of persons employed in-doors with varied exercise, which class includes the footman, waiter, &c.

The class of out-door employments does not present the same exact correspondence between the results of the former and of the present essay. While the ratio of consumptive cases was higher, and the age at which consumption occurred earlier, in those employments requiring the greatest exertion, there is found to be an excess of young persons in those requiring the least. When it is recollected that the class of out-door occupations requiring moderate exertion includes the errand-boy, messenger, postman, &c., the reason of this difference will at once appear. Old persons, being unfit for such occupations, it follows that there must be a marked excess of young persons engaged in them; and this excess is not counterbalanced by the somewhat greater liability to consumption of those whose occupations require a greater amount of exertion.

There are other points worthy of observation in the foregoing table. If we omit the class of in-door employments with varied exercise, the number of men above 40 and 50 in the other three classes varies directly as the amount of exertion; the number of men above 60 and 70, on the other hand, is inversely as the amount of exertion, being greatest where the exertion is least. This result confirms the statement already made, that the period of superannuation is probably earlier in men following the more laborious occupations. This may arise either from decay of strength or from their becoming subject, late in life, to diseases from which the other class is comparatively free. How far this explanation may be a valid one will be examined in a subsequent part of this paper.

The probability established by Table VI. of the preceding essay in favour of the beneficial effects of exercise in persons following in-door employments was strongly confirmed by the comparison instituted in Table VII. between the compositors and the pressmen, men working in the same atmosphere, and differing principally in the amount of exertion required by their respective occupations. The following table will be found to add greatly to the value of the conclusions of the former essay.

TABLE VI.—*Showing the Number and per centage Proportion of Compositors and Pressmen entered on the Hospital books, under and above the age of* 40, *and above the ages of* 50 *and* 60 *respectively; to which are added the Ratio of Consumptive Cases and the Proportion of such Cases occurring before* 40 *to those occurring after* 40.*

Occupation.	Under 40	Above 40	Above 50	Above 60	Cases of Pulmonary Consumption.	Ratio of cases of Pulmonary Consumption before 40, to those after 40
Compositors .	92	12	7	7	17	19 to 4 and
Pressmen . .	42	19	7	0	8	6 to 3, or about
Compositors .	88·46	11·54	6·73	6·73	1 : 3·47	5 to 1 and
Pressmen . .	68·85	31·15	11·47	..	1 : 5·12	2 to 1.

* See the former Essay, Table VII., and p. 208.

Every column of this table confirms in the strongest manner the general principle already laid down, that in-door occupations are healthy in proportion to the exertion which they require. Although, as has been stated, there is not any considerable difference between the ages at which the two classes of men begin their occupations, there is a great excess of compositors under 40 years of age, while the pressmen are more numerous in proportion above 40 and 50 years of age. Above 60, however, the compositors are again in excess, while the pressmen have disappeared altogether. Of the 104 compositors six were between 60 and 65 years old, and one 70 years of age, while the oldest pressman entered on the books was 59. Again, the ratio of consumptive cases is much higher among compositors than among pressmen; and the proportion of cases occurring before 40 still more considerable. These three concurrent probabilities must be admitted to have a force scarcely inferior to that of positive proof. The very considerable number of compositors who survive the injurious influences to which they are exposed is worthy of remark.* The fact, that out of 61 pressmen not one was met with above 59, is also remarkable. Does this circumstance arise from early superannuation, or from some fatal disease or diseases occurring about this period of life? An attempt will presently be made to answer this question.

Two other questions of interest were discussed in the former essay, viz., the effect of exposure to a high temperature and to dust. The influence of a high temperature, as far as it can be determined by the test of age, is shown in the following table, in which a comparison is made between men following this class of employments and those following other in-door occupations.

TABLE VII.—*Showing, in the case of Men following Occupations which expose them to a High Temperature, the proportion under and above* 40 *years of age, and above* 50, 60, *and* 70, *respectively.*

Nature of Occupation.	Under 40	Above 40	Above 50	Above 60	Above 70
Exposed to High Temperature.	67·74	32·26	16·79	4·53	1·60
In-door	73·98	26·02	13·60	5·62	1·67

The results of this table accord with those of the corresponding table in the former essay, inasmuch as it exhibits a proportional excess above 40 and 50 respectively. Above 60 and 70 respectively, the proportions are inverted, thus corresponding with the results obtained in the case of the compositor and pressman, and, probably due to the same causes, for those occupations which expose to a high temperature, are at the same time more laborious than in-door employments in general.

Exposure to dust was shown to create a high ratio of consumptive cases, and a proportionably high fatality before 40.† The following table shows the registered ages of the men included in Table XI. of the former essay, as exposed to dust.

* Thackeray, in his work on the Effects of Arts, Trades, and Professions, on Health and Longevity, p. 43, says, "We can scarcely find or hear of any compositor above the age of 50." The facts contained in this table will be the means of correcting such errors as this. I may add that I have met with a compositor at work, in perfect health, at 72.

† Table XI. of former Essay, and p 210.

TABLE VIII.—*Showing the Ages of Men exposed to Dust.*

Nature of Occupation.	Under 40	Above 40	Above 50	Above 60	Above 70
Exposed to Dust	56·95	43·05	13·89	1·39	0

This table presents a different result from what might have been anticipated, exhibiting a similar excess with the pressmen of middle-aged men, and an absence of men above 60 years of age. The number of facts upon which the table is founded, (72) is much less than those which have been used in most of the preceding tables, a circumstance which may possibly account for the want of correspondence between the foregoing table and the results obtained in the previous essay. When the class of sawyers is excluded, (an employment which exposes much less to dust than those of the mason and modeller,) the per centage proportion under 40 years of age becomes 61·82 instead of 56·95, and the greatest age is 57, instead of 63. The per centage proportion above 50 also, is 10·91, instead of 13·89. The number of cases, after this exclusion, being only 55, is too small to encourage any discussion as to the cause of the want of correspondence between the last table and the results obtained in the former essay.

The bad effects of habits of intemperance were illustrated in the former essay by the high ratio of consumptive cases, and the early occurrence of consumption among pot-boys. Among the same class the per centage proportion before 40 years of age is 86·05, and after 40, 13·95; the highest proportion, with the exception of compositors, hitherto obtained. The greatest age in 43 instances was less than 60.

The value of the probability established in the present essay must depend on the decision of the following question. Is the proportion of men at different ages, following different occupations, and entered in the out-patient books of an hospital, the same, or nearly the same, with that of healthy men following the same employments? In the course of an inquiry, as yet unfinished, into the sanatory state of the letter-press printers, the ages of 260 compositors and 60 pressmen having been noted down, enables me to contrast with Table VI. of the present essay, the observed age of healthy men, following the same employments. This contrast is made in the following table:—

TABLE IX.

		Under 40	Above 40	Above 50	Above 60	Greatest Age.
Compositors	Patients . . .	88·46	11·54	6·73	6·73	70
	In Health . .	86·92	13·08	5·00	1·92	72
Pressmen .	Patients . . .	68·85	31·15	11·47	..	59
	In Health . . .	68·33	31·67	15·00	1·66	64

Considering that the number of facts which form the basis of the comparison is here inconsiderable, there is a degree of correspondence which fully warrants the employment of the data used in this essay for

the purpose of establishing a probability; and this is all that was intended.

The results of the present inquiry, then, give all the confirmation which could have been reasonably expected to the conclusions established in the former essay. The ratio of consumptive cases to those of all other diseases, the proportion of such cases occurring before 40 years of age, and the per centage proportion of men following the several employments above 40, 50, 60, and 70 years of age respectively,—these probabilities in favour of the relative healthiness of the several classes of employment coincide to such an extent as strongly to confirm each other, and to give the force of the highest probability to those conclusions.

In the course of this inquiry a question has been raised as to the cause of the disproportionate number of old men in those employments requiring respectively little and much exertion. It has been shown that in the more sedentary occupations there is a high ratio of consumptive cases, an excess of such cases occurring before 40, and also an excess of men employed under that age; but that there are also more aged men engaged in these employments than in those which require a greater amount of exertion. This latter fact can be accounted for only on one of two suppositions; either the amount of exertion required by the more active employments is too great for healthy men of an advanced age, or those employments themselves, towards the decline of life, tend to produce fatal diseases, or diseases which render much exertion impossible.

In order to determine which of these alternatives ought to be embraced, it may be useful to compare the diseases proper to the two classes of employment. This comparison will show whether any class of diseases calculated to render laborious exertion difficult or impossible, is in excess among men using great exertion. The following table presents for the different classes of employment the per centage proportion of the principal diseases.

TABLE X.

Nature of Occupation.	Febrile Affections.	Catarrh.	Gout.	Struma.	Rheumatic Affections.	Nervous Disorders.	Mental Disorders.	Delirium Tremens.	Cerebral Affections.	Diseases of the Air-Passages and Lungs.	Pulmonary Consumption.	Disorders of the Circulating System.	Disorders of the Alimentary Canal.	Disorders of the Urinary Organs.	Skin Diseases.	Other Diseases.
In-door:—																
Requiring little exertion.	0·98	10·59	1·76	..	14.52	2·35	0·98	0·78	4·31	9·22	24·52	1·56	18·25	0·59	5·28	4·31
Requiring more exertion	0·91	10·22	1·39	0·91	15·02	2·72	0·52	0·52	5·05	7·90	18·39	1·82	21·62	1·17	8·18	3·75
Requiring great exertion	1·00	8·00	..	0·50	19·50	3·00	..	..	5·50	18·00	16·50	0·50	16·00	1·00	6·50	4·00
Out-door:—																
Requiring moderate exertion	0·44	7·96	2 21	..	24·78	..	..	..	3·98	11·50	17·70	1·33	19·03	0·89	3·54	6·64
Requiring greater exertion	1·22	10·81	1·51	..	20·25	2·28	..	0·75	5·18	14·61	19·95	1·37	12·78	0·46	4·72	4·11
Compositors	..	13·16	5·26	..	19·73	5·26	1·32	..	3·95	2·63	22·37	..	17·11	..	3·95	5·26
Pressmen	..	8·00	..	..	16·00	8·00	..	..	4·00	18·00	16·00	..	22·00	..	2·00	6·00

This table leads to the result, that whereas employments requiring little exertion create an excess of cases of pulmonary consumption,

those which require great exertion are characterised by a larger proportion of other affections of the air-passages and lungs. This result is strikingly shown in the cases of the compositor and pressman, employments which, as already stated, admit of very exact comparison. Of these affections of the air-passages and lungs, a certain proportion would be severe enough to render laborious employment impossible beyond a comparatively early age, while men following the more sedentary occupations, being more free from these diseases, may attain a much more advanced age. The only other diseases which increase uniformly with the amount of exertion are cerebral affections; but the increase is not so considerable as to have much effect on the proportion of aged persons in the two classes of occupation. The per centage proportions of the other diseases in the table do not differ so much, or so uniformly, as to be deserving of notice.

While the first part of the present inquiry has lent the strongest confirmation to the results established by the foregoing essay, the latter part of it has suggested a probable theory of the influence of different degrees of exertion upon health. This theory may be briefly stated thus.

The diseases of the lungs are, at all periods of life, among the most prevalent and the most fatal; their frequency and their fatality depending partly upon age, and partly upon the mode of life. Pneumonia in childhood, pulmonary consumption in manhood, and bronchial affections in old age, cause a great proportion of the mortality. Pulmonary consumption, the disease of manhood, is most prevalent in sedentary and in-door occupations, severe bronchial affections in those who lead a more laborious life. Sedentary employments are unfavourable to health in the many, but favourable to longevity in the few. On the other hand, employments requiring greater exertion, are favourable to youth and manhood, but unfavourable to old age.

Seeing, then, that both sedentary employments and those requiring strong exertion have an injurious effect on health, the one during early and mature manhood, the other towards the decline of life, it is important to press upon the one class the necessity of adding proper exercise to their sedentary occupations, and to caution the other against excessive and unremitting toil. It is the true interest of the public to render exercise attractive to the one, and to supersede, as much as possible, the necessity of violent exertion to the other. Public parks and gardens supply this great desideratum to the former class; the invention of machinery to the latter.

An interesting question is suggested by the comparative healthiness of men following out-door employments. They are exposed to all the changes and inclemencies of the weather, from which the in-door labourer is free, and these are acknowledged causes of many and severe diseases; nevertheless, there is the best reason to believe that they enjoy better health, and attain a greater average age. Is the inferior healthiness of the in-door labourer necessary, or dependent upon causes which admit of removal? It is difficult to imagine any other constant difference between the two classes of employment than the purity of the air. If it were possible to provide the in-door labourer with an ample supply of air as pure as that which the out-door labourer breathes, can it be doubted that other things, especially the amount of exertion, being equal in both classes of employment, the in-door labourer, by escaping the changes and inclemencies of the weather, would enjoy better health, and attain to a greater age? The facts already established in the case of the compo-

sitor show that this result may be reasonably anticipated, and the attainment of it is an object of the first importance. In large towns, the men employed within doors probably amount to more than the number following out-door occupations, and this disproportion is much more marked in females. The consequence of supplying this large number of persons with pure air would be to add some years to the most valuable part of their lives, to postpone the attack of pulmonary consumption to a later age, to save many who now fall victims to that disease, and to change some of the most unhealthy occupations into the most wholesome. If, at the same time that they breathed a purer air within doors, they had the facilities for, and the inducements to, exercise that are now denied to them, it would be difficult to estimate too highly the advantage which would accrue.

After the foregoing observations had been committed to writing, additional materials were placed at my disposal through the kindness of Mr. Chadwick, and by the permission of the Registrar-General. These materials, which have already served as the basis of some of the most important results contained in the Sanatory Report, consist of the deaths registered in the metropolis during the year 1839. It is proposed to make use of them as a test of the soundness of the conclusions already arrived at; and as a means of throwing additional light on the important subject of this communication.

From these mortuary registers, which comprise the following headings—the sex; the age; the residence; the occupation; and the disease—I have selected about 9,500 males above 15 years of age, and have arranged them in a table (Table XI.), which presents the employments and the age at which death took place. This table forms the raw material of the concluding part of the present essay.

TABLE XI.

Occupation.	Under 20 Years.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 90.	From 90 to 100, and upwards.
Artists	1	1	2	3	2	3	4	1	..
Bakers	9	18	34	35	32	32	9	4	..
Basket-makers	..	..	3	..	4	3	2	..	..
Bricklayers	8	15	27	29	34	17	6	2	..
Bookbinders	3	6	9	9	7	4	2	2	..
Brewers' labourers	1	7	20	10	4	6	1	2	..
Brush-makers	1	2	2	9	1	1	2	..	..
Burnishers	2	1	2	4	4	3	5	..	..
Butchers	2	21	23	30	24	18	11	3	..
Cabinet-makers	8	23	27	31	22	25	18	5	1
Carpenters	23	38	63	93	68	78	52	16	..
Carvers and Gilders	3	7	7	10	4	12	..	..	..
Clerks	32	44	62	49	39	21	22	4	..
Coach-builders	2	4	6	6	8	7	4	..	..
Coachmen	4	36	56	43	47	23	18	1	1
Coal-heavers	1	11	6	15	9	7	2	..	..
Compositors	3	11	8	9	3	2	..	..	..
Coopers	2	9	12	17	17	9	7	..	..
Curriers	..	4	9	8	9	4	4	1	..
Cutlers	1	4	3	3	1	..	2	..	..

TABLE XI.—continued.

Occupation.	Under 20 Years.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 90.	From 90 to 100, and upwards.
Dyers	3	3	7	6	5	7	3	1	..
Engineers	5	11	7	9	6	6	3	1	..
Engravers	4	6	6	4	4	2	5	3	1
French-polishers	3	5	4	1	1	..	1	..	..
Footmen	22	40	50	52	38	36	20	6	..
Founders	3	1	3	8	8	1	..	..	..
Gardeners	4	4	15	24	21	28	21	12	..
Gas-fitters	1	3	..	3	..	..	..	..	..
Glass-cutters	..	1	7	3	2	2	..	..	..
Gold-beaters	2	..	2	..	1	1	..	..	..
Grooms	6	13	20	18	17	3	6	..	..
Hair-dressers	2	13	7	15	7	13	9	1	..
Hatters	1	3	11	7	7	12	6	..	1
Hawkers	5	20	17	13	10	10	13	5	1
Japanners	..	2	1	..	2	3	2	..	..
Jewellers	4	7	13	11	11	13	2	3	..
Labourers	41	164	225	261	221	195	70	28	9
Locksmiths and Bellhangers	..	..	1	1	..	2	..	..	.
Masons	2	6	12	9	15	9	3	1	..
Messengers	7	8	19	17	30	21	19	7	..
Modellers	..	..	..	..	1	1	..	..	..
Musicians	1	2	4	8	4	3	1	..	..
Painters	7	31	53	47	32	24	11	1	..
Plasterers	1	4	10	17	7	2	3	..	..
Porters	9	28	52	61	48	27	16	3	..
Potboys	3	11	18	17	3	4	5	..	..
Pressmen	..	2	..	..	..	..	..	..	..
Printers	3	14	7	12	7	14	5	1	..
Saddlers	2	8	12	9	2	7	4	2	..
Sawyers	..	11	16	7	8	13	5	3	..
Singers	..	1	1	..	..	..	..	..	..
Smiths	10	22	31	28	47	38	14	3	..
Soldiers and Sailors	42	87	94	95	117	154	138	52	8
Shoemakers	15	53	61	63	60	65	48	16	1
Shopmen	9	23	15	21	17	27	12	4	..
Stokers	1	..	3	1	1	..	..	..	..
Tailors	13	62	45	52	52	37	41	6	1
Tanners	2	5	1	1	1	3	1	..	..
Travellers	2	4	2	1	5	2	..	..	1
Turners	1	3	5	10	5	3	2	..	..
Licensed Victuallers	4	10	16	16	16	12	4	..	1
Warehousemen	2	11	10	4	9	3	3	1	..
Watchmakers	2	11	5	10	13	18	10	5	..
Watchmen (including Policemen)	1	13	14	17	13	8	5	1	..
Weavers	8	21	14	18	15	27	24	6	..
Workers in Metal	4	6	10	12	13	12	4	1	1
Undertakers	2	5	6	3	..	3	..	..	..
Sedentary (various)	5	19	20	11	23	17	12	1	..
In-door, with slight exertion	3	21	17	15	20	15	7	1	..
Exposed to Dust	3	6	11	10	8	13	3	1	..
Exposed to Heat	..	1	3	4	..	4	1	..	..
Exposed to Animal Exhalations	..	3	2	6	1	1	1	..	..
Tradesmen	34	75	112	141	126	111	58	19	4
Gentlemen, including professional men	35	56	115	104	130	224	220	100	8

Before proceeding to make use of these materials it will be necessary to state the degree of value which they possess, and the objections to which they are exposed.

The sex and age are probably stated with a near approach to accuracy, and from a careful examination of the abstract it appears that they have been copied from the original records with as much care as could be reasonably expected. These headings, therefore, may be used with confidence as approaching nearly to the real state of the facts; and the same observations apply to the residences, which, as will be presently stated, form a useful element in the present inquiry.

The employments of the deceased are often stated with less precision, and with little discrimination. The two distinct occupations of the pressman and compositor, for instance, are rarely discriminated, two only of the former being entered, and a comparatively small number of the latter, the greater number of both being designated as printers. The same remark applies to some other employments. Another source of fallacy requiring to be noticed under this head consists in the frequent use of the same term for the tradesman and the artisan, the master and the workman. It is in avoiding this fallacy that the column of residences comes into play. By referring to this it was generally easy to determine whether the deceased was a tradesman or an artisan; and I have reason to believe that the distinction has been made with tolerable correctness.

It only remains to speak of the column of diseases. This, for obvious reasons, is the most imperfect; for, as the registration may be effected by any person present at the death, it must happen that the diseases are very incorrectly stated. Some of the most common and familiar diseases, as fever, small-pox, consumption, and rheumatism may perhaps be entered in about the proportion in which they actually occur, but all the more obscure diseases will be grouped with as little correctness as if they fell into their places by chance. In very many instances, again, a prominent symptom will be substituted for the disease of which it is a part; and the effect of a disease for the disease itself. Thus, a very large number of cases is entered as dropsy, which is a common result of a great many organic diseases. Many diseases, again, are entered as diseases of the chest without distinguishing affections of the heart from those of the lungs. In making use of this column of diseases, therefore, it would be necessary to form a few large groups, and to throw all cases entered as dropsy, or diseases of the chest, or which were otherwise loosely worded, or not readily included in the larger groups, into a miscellaneous class under the title of *other diseases*. Still with all these precautions it would not be possible to attain to such a degree of accuracy as would attach much importance to any inquiry into the cause of death. But little use has, therefore, been made of the diseases themselves, in the present inquiry.

From what has now been stated it must be evident that these fresh materials, like those already made use of, cannot suffice to establish independent truths, or strict numerical results, but merely approximations more or less close, and probabilities in support of others derived from independent sources.

It is proposed to make use of the materials contained in Table XI. for the purpose of examining in succession, and in the same order, the questions discussed in the former essay, and in the first part of the present one. The first comparison instituted was that between in-door

and out-door employments. The ratio of pulmonary consumption to all other diseases, in these two classes of occupation, was shown in Tables IV. and V., and the age at which consumption makes its attack in Tables XII. and XIII. of the first essay, while the number of men following the two classes of employment is exhibited in Tables I., II., and III., of the present essay. The actual number and per centage proportion of deaths for each decennial period, with the approximate average age at death, is shown in the following table.

TABLE XII.—*Showing, for each Decennial Period, the Number and per-centage proportion of Deaths, with the approximate average Age at Death, of Men following In-door and Out-door Occupations.*

Nature of Occupation.	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 & upwards.	Total.	Average Age.	Greatest Age.
In-door	227	578	690	730	638	627	385	97	6	3,978	47½	101
Out-door ...	155	484	646	698	640	546	342	117	20	3.648	48½	101
In-door.....	5·71	14·53	17·35	18·35	16·04	15·76	9 68	2·44	0·15			
Out-door ...	4·25	13·27	17·71	19·13	17·54	14·97	9·37	3·21	0·55			

This table confirms the results already obtained, inasmuch as it shows that there is no considerable difference, in point of healthiness, between in-door and out-door employments; for in both cases the ratio of cases of pulmonary consumption to those of other diseases was 1 to 3·89. The average age at death, also, differs only by one year. The chief difference between the two classes consists in the distribution of the deaths. It was shown in Table XIII. of the former essay that the deaths from pulmonary consumption before 40 years of age in in-door and out-door employments respectively were in round numbers as 81 and 63; that, in other words, men employed within doors die of consumption at an earlier age than those who work in the open air; and by the foregoing table it appears that from 15 to 30 years of age the deaths among the former class are in excess, while from 30 to 60 the reverse obtains. From 60 to 80 again the order is inverted, to be again reversed from 80 to 100 and upwards. Out-door labourers, then, appear to attain a greater age than men employed within doors.

These observations apply to in-door and out-door occupations taken in the mass without any exclusion of unwholesome employments, or of those which, belonging partly to both classes, were grouped with the former. This exclusion was made, and the result displayed in Tables V. and XIV. of the former essay, and in Table III. of the present. The following table presents the result of this exclusion, as regards the mortality.

TABLE XIII.—*Showing, for each Decennial Period, the Number and per centage Proportion of Deaths, with the approximate average Age at Death, of Men following In-door and Out-door Occupations, from which all exceptional Employments are excluded.*

Nature of Occupation.	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 & upwards.	Total.	Average Age.	Greatest Age.
In-door .	165	442	470	484	425	426	286	70	6	2,774	47½	98
Out-door .	134	435	600	651	607	521	329	116	20	3,413	49⅐	99
In-door .	5·95	15·93	16·94	17·45	15·32	15·36	10·31	2·52	0·22			
Out-door .	3·93	12·75	17·58	19·07	17·79	15·27	9·64	3·40	0·59			

The same correspondence which was shown to exist between the results of the preceding table and the conclusions of the former essay, and of the first part of the present essay, find place also in the case of the foregoing table. As the ratio of cases of pulmonary consumption, from being the same in both classes of employment, became 1 to 3·81, for men employed within doors, and 1 to 4·13, for those working in the open air, (Table V. of the former essay,) and the per centage proportion of men belonging to the first class, attacked with consumption under 40 years of age, instead of being, in round numbers, 81, became 83, and that of men belonging to the second class fell from 62·84 to 62·30, (Table XV. of the former essay,) as, moreover, a similar difference is found to exist in the per centage proportion, under 40, following the two classes of employment, so, (Table III. of the present essay,) in the foregoing table, there is a greater difference in the per centage proportion of deaths at the several ages. The result, therefore, of the elimination which has been made in these several tables is similar in all: it is that of causing a wider separation between the several values. The difference existing between the mortality of the two classes of men at the several specified ages is well shown in the curves at the end of the essay. (See Curve I., and as an illustration of the earlier age at which consumption occurs in men following in-door occupations, Curve II., which corresponds with Table XV. of the former essay.)

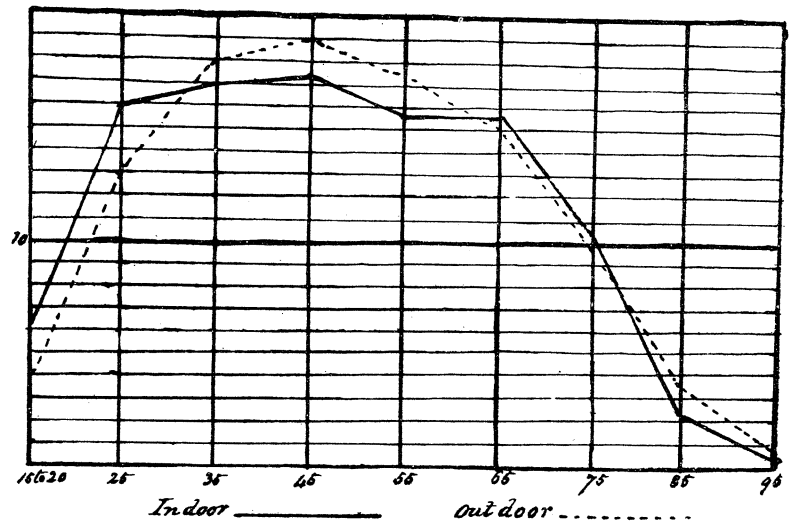
The next question examined in the preceding essay and in the first part of this, is the influence of different degrees of exertion on health. The following table shows the number and per centage proportion of deaths in men whose occupations require different degrees of effort.

TABLE XIV.—*Showing, for each Decennial Period, the Number and per centage Proportion of Deaths, with the approximative average Age of Death, in Men using different amounts of Exertion.*

Nature of Occupation.	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 and upwards	Total.	Average Age.	Greatest Age.
In-door:—												
Requiring little exertion ...	71	190	171	180	160	142	129	27	2	1072	46·86	98
Requiring more exertion...	61	188	228	236	206	215	129	31	5	1299	48·06	101
Requiring great exertion...	15	25	36	36	56	40	14	3	..	225	47·75	under 90
With varied exercise	33	74	75	77	64	66	35	11	..	435	45·68	under 90
Out-door:—												
Requiring moderate exertion	19	81	108	91	105	64	55	14	3	540	47·70	99
Requiring greater exertion	64	239	346	404	337	276	120	47	9	1842	47·60	98
In-door:—												
Requiring little exertion...	6·62	17·72	15·95	16·79	14·93	13·25	12·03	2·52	0·19	..	..	..
Requiring more exertion ...	4·70	14·47	17·55	18·17	15·86	16·55	9·93	2·38	0·39	..	..	..
Requiring great exertion...	6·70	11·11	16·00	16·00	24 89	17·78	6·22	1·33	..	..	..	..
With varied exercise	7·59	17·00	17·24	17·70	14·71	15·17	80·5	2·53	..	..	..	..
Out-door:—												
Requiring moderate exertion	3·52	15·00	20·00	16·85	19·44	11·85	10·18	2·60	0·56	..	..	..
Requiring greater exertion..	3·47	12 98	18·79	21·93	18·30	14·98	6·51	2·55	0·49	..	..	..

Some of the results of this table are more clearly exhibited in the following table, in which the per centage proportions under 40 and above 40, 50, 60, 70, 80, and 90 respectively are stated.

1


10
15 to 20
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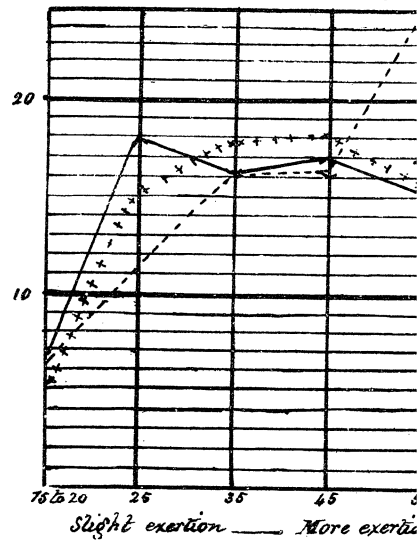
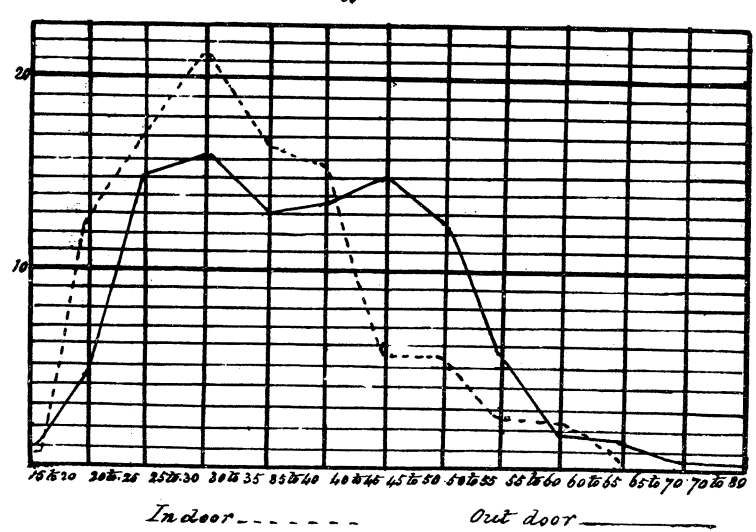
85
95
In door
Out door

3


20
10
15 to 20
25
35
45
Slight exertion
More exertion

2


20
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15 to 20
20 to 25
25 to 30
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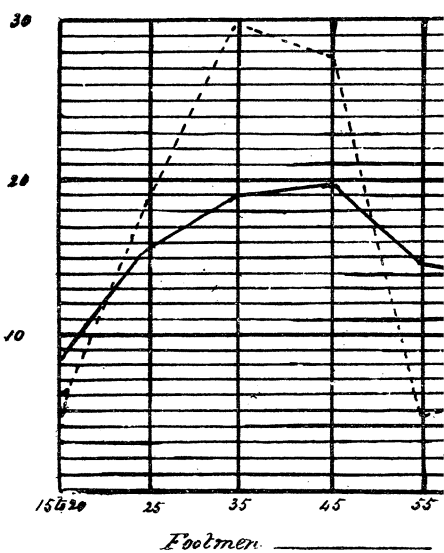
45 to 50
50 to 55
55 to 60
60 to 65
65 to 70
70 to 80
In door
Out door

4


30
20
10
15 to 20
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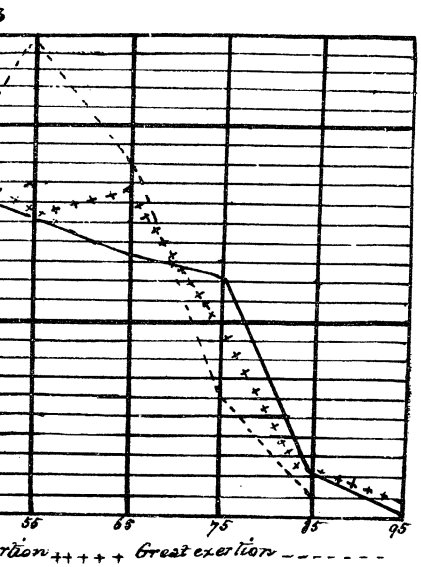
35
45
55
Footmen


55
65
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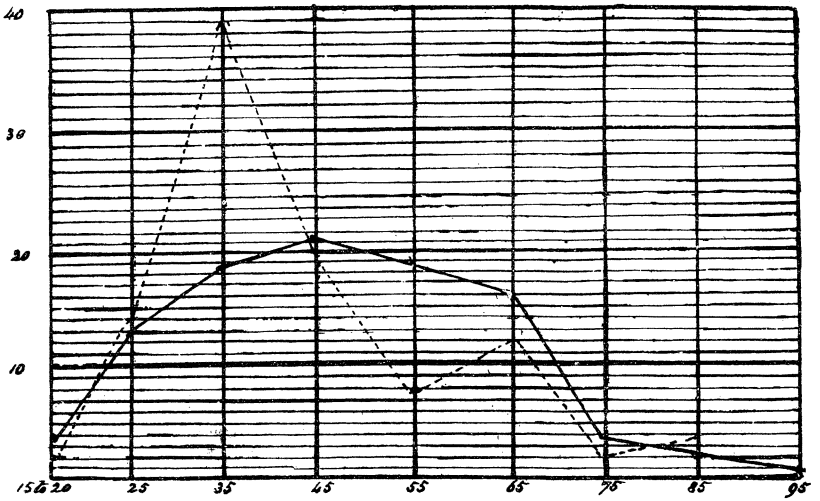
85
95
rtion ++++ Great exertion

5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75
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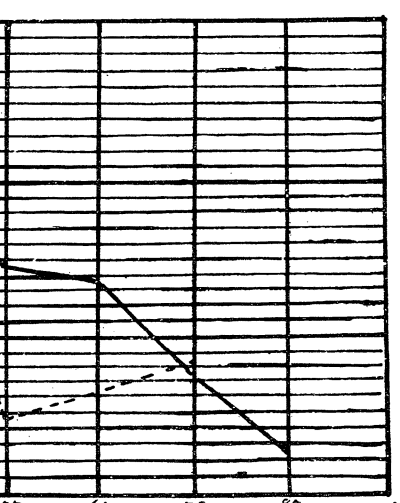
95
Labourers
Draymen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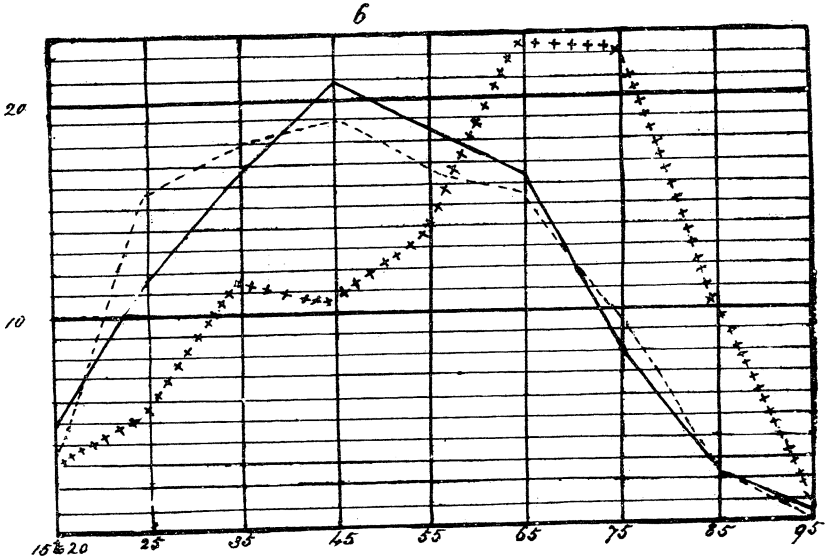
95
Potboys

6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15 & 20
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35
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65
75
85
95
Artisans
Tradesmen
Gentlemen

TABLE XV.—*Showing, for the several Classes of Employment, the per Centage Proportion of Deaths occurring before* 40, *and after* 40, 50, 60, 70, 80, *and* 90, *respectively.*

Nature of Occupation.	Under 40	Above 40	Above 50	Above 60	Above 70	Above 80	Above 90
In-door :—							
Requiring little exertion .	40·29	59·71	42·92	27·99	14·74	2·71	0·19
Requiring more exertion .	36·72	63·28	45·11	29·25	12·70	2·77	0·39
Requiring great exertion .	33·81	66·19	50·22	25·33	7·55	1·33	..
With varied exercise . .	41·83	58·17	40·46	25·75	10·58	2·53	..
Out-door :—							
Requiring moderate exertion	38·52	61·48	44·63	25·19	13·34	3·16	0·56
Requiring greater exertion .	35·24	64·76	42·83	24·53	9·55	3·04	0·49

In the first three lines of these tables, and in the corresponding decimals, will be found a confirmation of the results already obtained in the case of occupations carried on within doors. The ratio of consumptive cases was shown (Table VI. of the former essay) to be highest where the exertion required was least, and lowest where it was greatest: the per centage proportion of cases of consumption occurring before 40 was also shown (Table XVII. of former essay) to be greatest where there was least exertion, and least where there was most effort: and, lastly, in the first part of the present communication, the per centage proportion of men under 40 years of age, in the three classes of employments was shown to follow the same order, the proportion being highest in men using the least exertion, and lowest in those using the greatest exertion. The foregoing table presents only a partial correspondence with these results; for though the class of sedentary occupations holds the same place as in the tables just referred to, the position of the other two classes is inverted; for the class requiring moderate exertion presents a somewhat higher average age at death, a much greater maximum age, and a greater proportion of deaths above 60, 70, 80, and 90 respectively, than that consisting of the more laborious employments. It will be seen that in this latter class there is not a single death registered above 90, while in the sedentary class there are two, and in that requiring more exertion five, above that age, the maximum in the former case being 98 and in the latter 101.

The most remarkable feature in the table is the great increase of deaths from 50 to 60, and in a less degree from 60 to 70, in men following the more laborious employments. On referring to the mortuary registers, I find that this increase is due to deaths entered as consumption, as other diseases of the lungs, and as diseases of the brain, but more especially to the several diseases of the lungs. This fact confirms a conclusion drawn from Table X. of the present essay, viz., that employments requiring great exertion are characterized by a large excess of diseases of the lungs other than consumption. Curve III. exhibits the mortality at the several ages in these three classes of employment.

There is a close correspondence between the results of the former and of the first part of the present, essay, in respect to the class of in-door occupations with varied exercise. The ratio of consumptive cases in this class ranks next to that of men following sedentary occupations, and the per centage proportion of consumptive cases occurring before 40, the proportion of men following this class of employments, and the

proportion of deaths under that age, are greater than in any of the other classes. This group, as has been already stated, does not admit of strict comparison with the others, but it holds the same relation to them in three out of the four tables.

On comparing the two classes of out-door occupations, it will be seen that in the first class, there is a higher per centage proportion of deaths under 40, and a higher per centage proportion of men following that class of employments, while the ratio of cases of consumption, and the per centage proportion of such cases occurring under 40 is lower than in the second class. This apparent opposition is rendered intelligible by the fact already established, that the advent of pulmonary consumption is retarded in men following out-door employments, so that a low per centage proportion of consumptive cases occurring before 40 is quite compatible with a high per centage proportion of deaths.

A comparison of the two classes of out-door occupation confirms the statement already made that strong exertion is unfavourable to longevity; for the last five columns all present a lower per centage proportion of deaths above 50, 60, 70, 80, and 90 respectively among those following the more laborious occupations.

The comparison instituted in the first essay, and in the beginning of the present paper, between the compositor and the pressman, is rendered impossible in respect of the mortality, in consequence of these two occupations not being discriminated in the mortuary registers.

The effect of exposure to a high temperature is shown in the following table, in which the per centage proportions calculated from 457 deaths, are given.

TABLE XVI.

Nature of Occupation.	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 and upwards.
Exposed to heat	6·13	11·60	17·72	18·60	20·58	17·72	5·91	1·75	..
Other in-door occupations.	5·95	15·93	16·94	17·45	15·32	15·36	10·31	2·52	0·22

There is a great similarity between these proportions and those obtained in the case of men following the more laborious occupations. In both there is a low ratio of consumptive cases, a late occurrence of that disease, considerable mortality under 20, and between 50 and 60, and a small proportion of aged men.

The effect of exposure to dust is shown in the following table, in which the per centage proportions alone are calculated from 177 cases. As they consist almost entirely of persons employed out of doors, the numbers are compared with the total of men so employed.

TABLE XVII.

Nature of Occupation.	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 and upwards.
Exposed to dust	2·82	13·00	22·03	14·70	18·08	20·34	6·21	2·82	..
Other out-door occupations.	3·93	12·75	17·58	19·07	17·79	17·27	9·64	3·40	0·59

The results of this table are not so unfavourable as might have been anticipated from the high ratio of consumptive cases exhibited by Table XI. of the foregoing essay. There is an excess of deaths between 20 and 40, and between 50 and 70, and a lower ratio of aged men, but there is not that early mortality which the table already referred to would lead us to expect.

The injurious effects of habits of intemperance have been already more than once alluded to, and are clearly shown by the comparisons instituted in the following table, between the licensed victualler and tradesman in general, the potboy and footman, and the drayman and labourer. It is not pretended that these comparisons are very exact, but they may perhaps be fairly regarded in the light of useful approximations. There can be no doubt, too, that the class which has the most easy and constant access to the means of intemperance will be found to be the most addicted to drinking.

TABLE XVIII.

Occupation.	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 and upwards.	Average Age.	Greatest Age.
Licensed Victuallers	5·06	12·66	20·25	20·25	20·25	15·19	5·06	..	1·27	46¼	94
Tradesmen	5·00	11·03	16·47	20·74	18·53	16·32	8 53	2·80	0·59	48¾	97
Potboys	4·92	18·03	29·51	27·87	4·92	6·56	8·20	..	..	41⅓	under 80
Footmen.....	8·33	15·15	18·94	19·70	14·40	13·64	7·57	2·27	..	44¼	under 90
Brewers' Draymen.	1.96	13·73	39·22	19·61	7·84	11·76	1·96	3·92	..	43	under 90
Labourers.....	3·38	13·51	18·53	21·50	18·20	16·06	5·77	2·31	0·74	47½	98

Each of the comparisons thus instituted places in a more or less striking light the ill effects of habits of intemperance; but the difference between the licensed victualler and tradesman in general is less marked than that existing between the two other classes. The effect of intemperance in curtailing life is shown by the excess of deaths under 40 and 50, and especially in the interval between 30 and 40 years of age, by the lower average age, and by the lower maximum age at death of the intemperate classes. This comparison, however, displays but feebly the baneful influence of habits of intemperance; for, on the one hand, some who are exposed to temptation may be supposed to resist it; and, on the other hand, many tradesmen, footmen, and labourers, whose temptation is less, nevertheless fall into habits of intemperance. To show the effects of intemperance in all their fearful reality, it would be necessary to contrast the intemperate men belonging to the several employments, with the temperate men following the same occupations. I have not yet succeeded in obtaining the materials for such a comparison. As the last two contrasts in the table are very striking, they are illustrated by curves. (See Curves IV. and V.)

The mortuary registers which have been employed as the foundation of the foregoing observations have supplied the means of comparing the mortality of the three classes of gentlemen (including professional men), tradesmen, and artisans. This comparison is made in the following table:—

TABLE XIX.—*Showing, for each decennial Period, the Number and per centage Proportion of Deaths, with the approximate average Age, and the greatest Age, occurring among Gentlemen, Tradesmen, and Artisans respectively.*

Condition.	15 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 and upwards.	Average Age.	Greatest Age.
Gentlemen, &c....	35	56	115	104	139	224	220	100	8	58·61	98·
Tradesmen.....	34	75	112	141	126	111	58	19	4	45·84	97·
Artisans, &c.	367	1060	1350	1437	1277	1184	730	217	26	48·06	101·
Gentlemen, &c...	3·50	5 60	11·50	10·40	13·90	22·40	22·00	10·00	0·80		
Tradesmen, &c...	5·00	11·03	16·47	20·74	18·53	16·32	8·53	2·80	0·59		
Artisans, Labourers, &c. ..	4·80	15·06	17·65	18·79	16·69	15·48	9·04	2·14	0·34		

The results of this table are similar to those which have been already obtained by other observers. The slight difference existing between the two classes of tradesmen and artisans is worthy of notice, especially as the latter class is doubtless represented somewhat unfavourably, in consequence of the exclusion of persons dying in workhouses, of the more aged of whom a large proportion belong to the labouring class. If these persons were included, there is good reason to believe that a still less difference would be found to exist between the two classes, and it is not impossible that the comparison would even turn out to the advantage of the artisan. As the average age of persons above 21, dying in the workhouse, is 60,* this supposition is by no means an improbable one. The comparison here instituted is illustrated in Curve VI.

The following summary combines the conclusions of the former essay with those deduced from the facts and reasonings of the present communication.

A comparison of in-door with out-door occupations leads to the following results:—

1. The ratio of cases of pulmonary consumption to those of other diseases is somewhat higher in persons following in-door occupations, than in those working in the open air; and this rule applies to both sexes.

2. Pulmonary consumption occurs at an earlier age in men following in-door occupations than in those following out-door occupations.

3. The probable excess of cases of pulmonary consumption in men following in-door occupations, (for a higher ratio of consumptive cases in these employments is merely a strong presumption in favour of such excess,) and the earlier age at which consumption makes its attack, would naturally tend to fill this class of employments with a greater number of young men, as well as to occasion a higher mortality at the early periods of life, and a lower average age of death. Accordingly, among those employed within doors, there is an excess of young persons, a higher mortality in early life, and a lower average age of death. The greatest age, as it happens, is the same in the two classes.

The classification of in-door employments, according to the amount of exertion which they require, leads to the following results:—

1. The ratio of cases of pulmonary consumption to those of all other diseases is highest where the amount of exertion is least, and lowest, where it is greatest; and the intermediate degree of exertion presents an intermediate ratio.

* From the abstract of deaths in the metropolis for 1839, prepared by Mr. Chadwick.

2. The age at which pulmonary consumption makes its attack is earlier in employments requiring little exertion, than in those requiring more exertion, and in those requiring moderate exertion than in those demanding great effort.

3. The per centage proportions of men under 40 years of age following these three classes of employment is in strict accordance with the ratio of consumptive cases, and the ages at which consumption makes its attack; those proportions following the exact order of the degree of exertion.

4. The age at death also follows the same order, the per centage proportion of deaths under 40, being highest where there is least exertion, lowest where the exertion is greatest, and intermediate where there is a medium degree of exertion.

5. The average age of death, also, is lowest where there is least exertion, but highest where the exertion is intermediate between the two extremes. The somewhat lower average obtained in the case of employments requiring great exertion, appears to depend on an excessive mortality under 20 years of age. The greatest age also occurs in occupations requiring a medium degree of exertion, the least maximum in those demanding the greatest effort.

6. In the class of in-door occupations, with varied exercise, (a class including the footman, waiter, &c.,) the ratio of cases of pulmonary consumption ranks next to that of the sedentary occupations, and the per centage proportion of consumptive cases occurring before 40, the per centage proportion of men so employed under that age, and the per centage proportion of deaths are higher than in any of the other classes, while the average age of death is lower. This class, however, stands alone, inasmuch as young men are in comparatively greater request, and old men comparatively little wanted.

7. The class of out-door occupations requiring moderate exertion, presents a higher per centage proportion of deaths under 40, and a corresponding excess of young men; but the ratio of consumptive cases, and the per centage proportion of such cases occurring under 40 are lower than in the class requiring greater exertion. This apparent anomaly may probably be explained by the fact that the attack of consumption is postponed till a later age, in men following out-door employments, than in those working within doors.

8. The maximum age in the case of men following the more laborious out-door employments is lower by one year than in those using less exertion, and in the latter, there is a considerable excess of aged men.

9. Sedentary employments, and those requiring little exertion, are more unfavourable to adult and middle age, but more favourable to old age, than those requiring greater efforts; on the other hand, employments requiring great exertion are unfavourable to youth and longevity, but favourable to middle age. Employments requiring little exertion prove fatal, by inducing an excess of cases of pulmonary consumption early in life, those requiring great exertion, by occasioning other diseases of the air-passages and lungs, towards the commencement of old age.

The following observations apply to certain occupations, examined separately in the former essay, and to the effects of intemperance:—

1. The exposure to a high temperature does not appear to exercise any injurious influence upon health, during the early periods of life; but, in common with employments requiring a great amount of exertion, it is unfavourable to longevity.

2. The inhalation of dust does not appear to be attended with the extremely injurious consequences which the high ratio of cases of pulmonary consumption would lead us to expect; but when compared with the aggregate of other out-door occupations, the employment of the mason is found to be, in some degree, less favourable to health and longevity.

3. Habits of intemperance appear to exercise a most injurious influence upon health; for men peculiarly exposed to the temptation of drinking present a high ratio of cases of consumption, a high per centage proportion of such cases occurring under 40, an excess of young men, an excess of deaths under 40, and especially between 30 and 40 years of age, and a low average and maximum age.

Lastly. A comparison of the age at death of gentlemen, (including professional men,) tradesmen, and artisans, issues in displaying the great advantage which the first class possesses over the other two, and the comparatively small difference which exists between the tradesman and the artisan. The average age of death of the first class exceeds that of the other two by 10 years, while the average age of the tradesman exceeds that of the artisan only by a small portion of a year.

The present inquiry, then, confirms the results to which other observers have arrived, by showing the great and undue advantage which the higher classes enjoy over other members of society. They live longer, and may be fairly presumed, while they live, to enjoy better health. This advantage is not to be wondered at, considering the better supply of air and food which they receive; the more spacious houses which they live in; and the greater care bestowed on the places which they inhabit. It is also partly due to the facilities which they enjoy for exercise in the open air. The great difference which exists between the gentry and other members of society, however, is not more worthy of notice than the very slight advantage which the tradesman enjoys over the class of working men. If we limit the comparison to the average age, we find that the tradesman lives about three-quarters of a year longer than the entire class of working men, little more than a year and a half longer than the class employed solely within doors, two years longer than men following the more sedentary occupations, and about three years longer than the class which consists chiefly of domestic servants. On the other hand, the life of the tradesman is shorter by about a quarter of a year than that of the entire class of out-door labourers.

The little advantage possessed by the tradesman over the mass of working men probably results from the sedentary life he leads, his want of proper exercise, and the small space which the necessities of business allow him to give to the accommodation of himself and family. Taking one tradesman with another, it is perhaps not unreasonable to suppose that he habitually breathes an air as impure, and follows an occupation nearly as unwholesome as the class beneath him. The labour which the working man has to undergo, provided it is not carried to excess, is more favourable to health than the confinement to which the tradesman is subject, and this confinement raises him in the scale of mortality but little above men following the more sedentary occupations. Both classes of men, the tradesman and the working man, are doubtless exposed to unwholesome influences, which might be wholly removed, or greatly

mitigated by the interference of others, or by their own precautions. Both classes probably suffer to a greater degree than they imagine from those habits of intemperance from which the higher classes have nearly emancipated themselves, but which still form the great physical and moral bane of the mass of our population.

The bad effects of sedentary habits, on the one hand, and of laborious exertion on the other, have been fully demonstrated in the course of this and the former essay. How much of the waste of life and health is due to the bad air which the in-door labourer is constrained to breathe; how much to the inclemencies of the weather to which the out-door labourer is exposed; how much to the unhealthy habitations which both classes are compelled to live in; and how much to the bad habits in which both indulge, it is impossible to determine. These causes are so mixed up together as not to admit of that separation which must precede a correct estimate of their comparative influence. But that unwholesome dwellings, and bad air, and intemperate habits do tend to injure health and shorten life, there is abundant proof; that the permission of such things, where it is possible to rectify or prevent them, is bad economy there can be no doubt. Unfortunately for the sufferers by these unwholesome influences, it is much more easy to establish general principles concerning them than to point out the precise amount of injury which they occasion. How many thousand unnecessary victims pulmonary consumption claims year by year it is impossible to ascertain; whether this chronic plague is more or less destructive than the kindred pestilence which is constantly snatching away so many of our adult population must remain a subject of conjecture; but of this there can be no reasonable doubt, that in addition to those who might have escaped consumption, and reached at least the borders of old age, a large proportion of all who die of that disease die much earlier than they would if they had been placed in more favourable circumstances. As each unnecessary death from consumption represents the loss, after a slow and lingering illness, of one of those who form the real strength of society, so the death of each father of a family at an age when those who depend upon him for support are most helpless, is the source of an amount of private suffering and privation, and oftentimes of expense to the public which is much more easily conceived than estimated. To complete the calculation of the cost to society in this one disease alone, which results from unwholesome influences admitting of removal, it would be necessary to add the hereditary taint transmitted from the consumptive parent, and ready at a fitting season to cut short the life of the child, after he in his turn has bequeathed the same sad legacy to his offspring. Thus it happens that the seeds of disease are more thickly sown with each new generation, and death reaps an earlier and more abundant harvest, and a race of men famed for strength and vigour is doomed to slow but sure degeneracy.

There are many subjects touched upon in this essay which require a more extended examination; some conclusions built up upon too narrow foundations, and much still remaining to be done, which will demand a great outlay of time and labour. For this the author is prepared, and he will avail himself of every opportunity which shall be afforded him of throwing additional light upon this most interesting and important subject. He has already entered upon a minute investigation of the sanatory state of one of our most valuable classes of workmen, the results

of which inquiry he has no doubt will form, at some future time, an acceptable contribution to the records of the Statistical Society.

In conclusion, the author is anxious to guard against a possible misconception. It is not intended to represent all the conclusions which have been arrived at, as entirely new or unexpected, but simply to deduce from facts carefully observed and registered, results altogether independent of the previous labours of others in the same direction. Such independent labours furnish the best confirmation or refutation of the statements of others, at the same time that they afford a fair chance of arriving at novel and unexpected results.

Account of a Report of M. Villemain, the French Minister of Public Instruction, on the State of Superior Education in France. By James Heywood, Esq., F.R.S.

[*Read before the Statistical Section of the British Association, 21st August*, 1843.]

In March, 1843, M. Villemain presented to the King of the French a report on secondary education, that is, on superior school education, and, at his suggestion, the King was pleased to direct that a general report on the public and private establishments of secondary instruction should be prepared every five years, with an account of the state of that class of instruction during the quinquennial period then elapsed; and His Majesty further declared his pleasure that the report should be published and distributed to the members of the Chamber of Peers and of the Chamber of Deputies.

The Government in France possesses control over all the education of the country, with the exception of the colleges for the education of the clergy, which are termed seminaries, and their subordinate institutions. The primary or elementary schools of France, the royal colleges or public schools, the normal school for the education of schoolmasters, the parish colleges or schools, the schools called institutions, and the smaller boarding-schools or "pensions," are subject to Government inspection, and many of them receive aid from the public funds in case of need. The higher academies, which are called in England universities, are also subject to the power of the Government; but the word "university" has been extended in France from its original signification to include the whole educational system, under the direction of the Government.

The Minister of Public Instruction is, *ex-officio*, the Grand Master of the University in France, and the improvements which are made from time to time in the educational plans of the Government are to be traced in a great measure to the talent and learning of this commanding officer. The formation of the French University, on its vast scale of extent, is due to M. de Fontanes, who was its first grand master, in 1808, under the reign of Napoleon.

Secondary instruction includes the study of the ancient languages, of literature (lettres), and of the mathematical and physical sciences. Its object is to prepare pupils for the learned professions, for great intellectual exertion, and for the higher offices of life generally. The youth who avail themselves of a superior kind of education give up to instruction a portion of life which, in other classes of society, is usually devoted to profitable labour; and the expense of this superior school education